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AUTHOR Graves, Norman John
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ABSTRACT

The meaning of objectives in geographic education and the need to structure objectives in some hierarchical manner are presented in this paper. Discussion in past years centered on the teaching of general objectives in geography classes. During the last twenty years, however, geography instructors realized that objectives may be at various levels of generality or specificity and this led to a focus on behavioral objectives. Bloom's Taxonomy was used in an attempt to structure the objectives of geography teaching into a hierarchy from the point of view of the intellectual abilities required to achieve these objectives. However, such a hierarchy is incomplete if examined from the point of view of a teacher attempting to structure a geography course. This hierarchy structure disregards the idea that concepts of widely differing intellectual levels may be involved, ignoring the data of a relationship between concepts and levels of operation. It is suggested that a logical structure exists in which more complex concepts are based on an infrastructure of simpler ones. Therefore the development of a geography course could depend on a close analysis of the logical structure of concepts and principles inherent in the topics taught, and on their careful arrangement as a series of hierarchial performance or behavioral objectives. (SJM)

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AUTHOR GRAVES, Norman John

AFFILIATION Department of Geography,
University of London Institute of Education
London, U.K.

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INTRODUCTION

For the first 50 years of this century, discussion concerning the objectives of geography teaching was largely concerned with the general objectives and often took the form of a justification of the subject at school level. Evidence for this may be found in texts published on the teaching of Geography (Geikie 1887, Fairgrieve 1926, Long and Roberson 1966) and in the suggestions and instructions issued by various ministries of education in those countries where geography was part of the school curriculum (HMSO 1960). These general objectives included training in observation, informing future citizens about world and national problems, promoting international understanding and enabling students to bridge a putative gap between the sciences and the humanities. They amounted to articles of faith in what was a relatively new subject, but were seldom accompanied by evidence that such objectives were achievable.

In the past twenty years geographers and educationists through a process of cross fertilisation have become aware of each other's contribution to the continuing problem of defining objectives in education. As a result discussion has led to a realisation that objectives may be given at various levels of generality or specificity (Bloom 1956, Kasperon 1967, Graves 1971). This has led to a tendency in recent literature to

concentrate on behavioral objectives (Clegg 1970). The objectives are of help to the teacher requiring precise guidance, though they might be cramping the style of the more creative "intuitive" teacher. Objectives which are specific without having the precision and circumscription of behavioral objectives might still be useful; for example: "the learner shall be able to describe from 1/50,000 scale map evidence the relationship (if any) between relief and lines of communication".

Such discussion on the specificity of educational objectives assumes that what is to be taught is valuable educationally. Some way of assessing the value of such objectives was therefore required and many have used Bloom's Taxonomy of Educational Objectives (The Cognitive Domain) to assess the intellectual worthwhileness of certain objectives. Those objectives which could be classed as exhibiting characteristics of the abilities to evaluate, synthesise, analyse, being considered superior to those which only exhibited the characteristics of knowledge or comprehension. Thus the use of Bloom's Taxonomy may be seen as an attempt to structure the objectives of geography teaching into some sort of hierarchy from the point of view of the intellectual abilities required to achieve these objectives. Such a classification does not, however, dispose of the question as to whether what is taught, even if it may be classed as "evaluation", is educationally worthwhile. It is beyond the scope of this paper to discuss this philosophical question. Suffice it to indicate that if education is conceived of as a process of initiation into forms of knowledge (Peters 1965), then we may use the criterion that any objective which is super-

fluous to this process of initiation into the concepts and principles of geography should be eliminated.

THE IDEA OF A HIERARCHICAL CLASSIFICATION OF GEOGRAPHICAL OBJECTIVES

Bloom's taxonomy of educational objectives has been widely interpreted in the hierarchical way suggested in the previous paragraph. Such a hierarchy is, however, incomplete if examined from the point of view of a teacher attempting to structure a course in geography. For example, under the category I "Knowledge" one finds "knowledge of terminology". One could therefore place in this class both the terms "westerly wind" and "geostrophic wind"; or the terms "coniferous forest" and "ecosystem". It would seem evident upon analysis that these terms are not on intellectually equivalent levels, that "geostrophic wind" is a more difficult concept than "westerly wind" and "ecosystem" more complicated than "coniferous forest". This problem was examined by Gagné (1966) in relation to concepts in physics. He showed that simple concepts could be determined by observation; for example students in geography may learn to distinguish between photographs representing an oxbow-lake and those not representing this feature. These he called "concepts by observation". Some concepts cannot be observed in this sense; for example the relatively simple concept of density of population is not an observable concept. One cannot observe a series of landscapes and indicate which one has a "density of population", even though one might be able to make a judgement about whether or not a landscape was densely populated. The concept of "density of population" has to be defi-

ned in terms of some more basic concepts in this case: population and area. Such concepts Gagné has called "concepts by definition" or "principles". They involve relations between other concepts and usually with some operation implied. In the example given, "density of population" involves the operation of division since population density is expressed in terms of numbers of people per unit area. To take another example, the concept of "dynamic equilibrium" currently in use in geomorphology (Small, 1969) involves the understanding of a whole series of other concepts, such as those of erosion, weathering, slope, mass movement, lithology and so on. Such a concept could be termed an "organising concept" since it encompasses a wide range of related concepts concerned in the explanation of equilibrium in the processes of earth sculpture. Therefore, even in such a lowly category in the Bloom Taxonomy as "knowledge of terminology", concepts of widely differing intellectual levels may be involved.

The above analysis yields the idea that, in some aspects of geography, there exists a logical structure in which more complex concepts are based on an infrastructure of simpler ones. A simple example would be that understanding the term "drainage basin" implies some prior knowledge of such concepts as river, tributary, relief and watershed (or water parting) probably in that order. A more elaborate example would be that an understanding of Hoyt's model of urban structure implies some understanding of urban functions, urban land use categories, the idea of models as ideal representations of certain aspects of reality, again probably in

that order. There is, of course, no continuous linear structure in geography, but rather a series of parallel lines, some having cross links. For example, a progressive development along conceptual lines of ideas connected with a vegetation ecosystem is bound to connect with a similar development of ideas connected with the concept of soil. It might therefore be thought that the development of a course in geography could depend on the close analysis of the logical structure of the concepts and principles inherent in the topics taught, and their careful arrangement as a series of hierarchical performance or behavioral objectives, in the same way as learning to solve simple equations in mathematics must precede the solving of simultaneous and quadratic equations.

Unfortunately there are certain difficulties which need to be resolved. When Gagné writes of "concepts by observation", he is referring to the ability to recognise certain things as belonging to a class or category of objects. Thus children may be able to distinguish oxbow-lakes, deltas, cuestas, cirques, arêtes, etc. from exemplars and non-exemplars. This, however, is a rather different ability from being able to explicate these concepts. Thus though a student may be able to recognise a delta, his "expressed concept" of a delta may be rudimentary or sophisticated depending on the depth of his understanding of what a delta is. The concept delta may therefore be apprehended at many different levels of understanding. (It might be argued that at some levels, the concept was incomplete). The same could be said of many "concepts by observation" and the idea of using these as the bricks upon which the conceptual structure of geography could be built is probably an oversimplification.

Another difficulty lies in knowing whether the logical order which might be established by a close conceptual analysis of geography is mirrored in any way by students' psychological development. Apart from Piaget's and Inhelder's (1956) work on children's conception of space which revealed that topological relationships are acquired before Euclidean relationships, studies so far indicate that there is an increase in the quantity of geographic concepts acquired as children mature (Milburn 1969, Lunnon 1969), but not how these concepts relate to oneanother in the temporal sequence of learning. We are still very much in the dark concerning this aspect of learning in geography.

CONCLUSION

The meaning of objectives in geographic education is now much clearer than it was. The task of structuring objectives in some hierarchical manner which would be valid both for the logic of the subject and for the mental development of students has hardly begun. Many studies on the logical structure of the discipline such as Harveys (1969), on the conceptual understanding of geographic ideas and principles by children and on the way children perceive their environment will be needed before much progress can be made in this field.

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